Internal Government Studies

1995

Reports and Presentations

Study Name: **Electra-Optical Imager & Radiometer**

Team Members: **NOAA/ORA(J. Alishouse & N. Rao) & Aerospace Corp(F. DeLuccia)**

IPO POC: **Lt. Kevin Westley**

INTERNAL GOVERNMENT STUDIES - FY 1995
Electra-Optical Imager & Radiometer

Presentation/Paper Title	Author(s)	Date
"Final Report, Electro-Optical Imager and Radiometer(EOIR): An NPOESS Internal Concept Study"	J. Alishouse C.R. Rao	SEPT 95
"EO Sensor Design Studies, ICS Final Presentation and Report"	G. Rossano	28 SEPT 95
"EO Sensor Design Studies, ICS Final Presentation"	C.R.Rao	28 SEPT 95
"Calibration of the NPOESS E-O Sensor, ICS Final Presentation"	J. Alishouse	28 SEPT 95
"E-O Sensor Hardware Design Characteristics, Final Report and Future Study Recommendations"	----------	SEPT 95
"E-O Band Selection for NPOESS Based on Key Parameters"	D. Lynch	SEPT 95
"EO Imager Baseline Requirements Presentation"	----------	JUNE 95
"ICS Interim Status Review Meeting, Electro-Optical Imager & Radiometer"	D. Lynch	29 JUNE 95
"ICS Interim Status Review, EO Imager & Radiometer:	C.R. Rao	29 JUNE 95
"ICS Interim Status Review, Calibration Issues for the NPOESS E-O Sensor"	J. Alishouse	27 JUNE 95
"EO Imager ICS- June Progress Report"	Lt. K. Westley	20 JUNE 95
"EO Imager ICS- May Progress Report"	Lt. K. Westley	16 MAY 95
"EO Imager ICS- April Progress Report"	Lt. K. Westley	2 MAY 95
"EO Sensor Baseline Design, EO Sensor Progress Report Briefing", (draft copy)	G. Rossano	21 APRIL 95

PRESENTATION TO

NPOESS IPO

CALIBRATION OF THE NPOESS E-O SENSOR

BY

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28 SEP 95

PRE-LAUNCH CALIBRATION

Establish Correct Spectral Intervals

E-O RADIOMETRIC CHANNELS

CENTRAL WAVELENGTH (Micrometers)	HALF-WIDTH (Micrometers)	1% OF PEAK (Micrometers)
0.615 ± 0.005	N/A	≥0.60 & ≤0.63
0.870 ± 0.005	N/A	≥0.85 & ≤0.89
1.61 ± 0.015	≥ 0.05	≥1.54 & ≤1.69
3.73 ± 0.03	≥ 0.19	≥3.44 & ≤4.01
8.60 ± 0.07	≥ 0.25	≥8.3 & ≤9.0
10.8 ± 0.1	10.3±0.1 & 11.3±0.1	≥9.9 & 111.9
12.0 ± 0.1	11.5±0.1 & 12.5±0.1	≥10.9 & ≤13.1

E-O RESOLVING POWER

Channel	Λ_c	$\Delta\Lambda$	Resolving Power
1	615 nm	5 nm	123
2	870 nm	5 nm	174
3	1.61 Mm	0.015 Mm	107
4	3.73 Mm	0.03 Mm	124
5	8.60 Mm	0.07 Mm	123
6	10.8 Mm	0.1 Mm	108
7	12.0 Mm	0.1 Mm	120

Resolving Power = $\Lambda_c/\Delta\Lambda$

Mm = Micrometer

RADIOMETRIC ERRORS FROM SPECTRAL ERRORS

Satellite	Ratio[4]-Channel 1	Ratio[4]-Channel 2
NOAA-6	1.000	1.000
NOAA-7	0.991	1.121
NOAA-8	1.025	1.039
NOAA-9	1.069	1.077
NOAA-10	0.999	0.991

[4] Ratios computed using Neckel and Labs (1984) solar spectral irradiance model

Spatial Resolution

Imaging - 650 m, global contiguous coverage
Radiometric - 1.1 km (nominal) at nadir, global contiguous coverage with constant angular field-of-view

Other Issues

Linearity of Response
Striping (detector arrays)
Stray (scattered) Light
Channel Registration

POST-LAUNCH

On-board

Sun vs Lamps

Diffuser. vs Integrating Sphere

Monitor for Monitor

Heritage - SBUV/2, MODIS

Infrared
On-board BB

Vicarious

Stable Earth Targets

Supporting Surface and A/C Observations